J15 Validating the ImageXpert™ Full Motion System: A Foundation to Support Future Research Into Document Authentication

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After attending this presentation, attendees will learn about current research being conducted by the U.S. Immigration & Customs Enforcement's Forensic Document Laboratory (FDL) to validate the ImageXpert® Full Motion System.

This presentation will impact the forensic community and/or humanity by demonstrating how the implementation of an automated imaging system such as the ImageXpert® system will provide a means for the forensic document community to report an accurate and objective forensic finding on the authenticity of a questioned document such as a passport, visas, or banknote.

ImageXpert® Full Motion System is an automated machine-vision based image quality analyzer developed by ImageXpert, Inc. of Nashua, New Hampshire. ImageXpert® has established a reliable reputation amongst manufacturers in the digital printing industry and many companies have incorporated such vision systems into the inspection/testing phase of their products. Over the past few years, several studies have been undertaken utilizing this system to determine its effectiveness. These preliminary studies have proven to be quite promising; therefore, this study was undertaken to provide further confirmation of the accuracy and capabilities of this system and to establish whether or not the results would be precise enough to withstand the scrutiny of a court of law. The ultimate goal of this ongoing research is to determine whether or not the system can provide a more objective, quantitative means for document examiners to authentic questioned documents through the use of print quality measurements.

Although previous studies of the ImageXpert® system focused primarily on those measurements which would differentiate between genuine and counterfeit documents, this study was geared toward the validation of the system itself and; therefore, all of the measurements executable by the system were considered in this study and were tested as completely as possible. The study of all of these measurements was conducted using a NIST (National Institute of Standards) traceable calibration target to insure the accurate reporting of the error rates. The authors will discuss the methods and procedures used during the calibration of the system and will also present many of the variables encountered during the testing. Because of the fact that vision based systems operate with the use of specialized lighting and cameras, it was extremely important to systematically calibrate the instrument while performing the test to ensure accurate results.

The primary focus of this study was to establish the repeatability and accuracy of the print quality measurements offered by the ImageXpert® system. This validation process involved detailed testing under a variety of conditions while recording large amounts of data. A range of instrument performance was defined based on the data collected. Attendees will become familiar with a variety of the print quality measurements tested and the results of the validation process, which will include a detailed listing of error rates corresponding to the tested measurements. The authors will discuss operational limitations and variables that attributed to the error rates. They will also provide insight into the direction of future projects using print quality measurements and the laser height profiling unit.

Questioned Documents, Forensic Document Examination, Travel Documents